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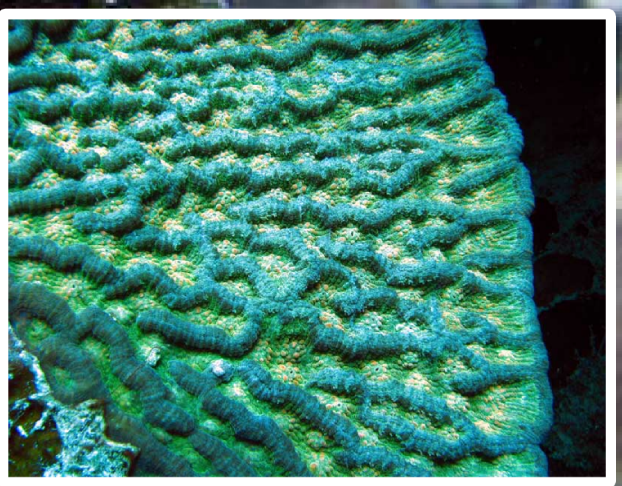

Large Polyp and Fire Corals
Top-Down Photography Techniques
Aquariums and Fumigation
Freshwater Aquaria

photographs by Jake Adams

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Dendrogyra cylindricus (main) and *Mycetophyllia ferox* (inset). Photographs by Jake Adams.

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ADVANCED AQUARIST'S ONLINE MAGAZINE

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EDITORIAL

May 2008

By Terry Siegel

I have been maintaining a reef tank for many years, and can say without hesitation that significant water changes are vital.

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Water change in reef aquaria is a topic that induces what appears to be endless discussion and, in my opinion, for good reason. Some reef keepers talk about the value of water changes, arguing that it removes or at least dilutes relatively toxic substances that have built up over time due to the metabolic processes of the living organisms in their reef biotopes. Others argue that water changes replace essential trace elements that have been over time depleted by these same reef organisms. My experience tells me that both arguments are correct.

Many years ago Peter Wilkens studied the loss of trace elements in a particular reef tank that he maintained. The formulation of Combisan was based on this research. However, what is true of one reef tank is not necessarily true of another as there are too many variables - biomass, feeding, temperature, lighting, etc. -- in a complex biological environment to account for all of them. Nonetheless, it is anecdotally safe to assume that trace elements are lost over a given time period, which ones and at what concentration is almost impossible to be definitive about.

What is added to the water that is toxic to some and partially toxic to others by the organisms over time in a reef tank is equally difficult to know with precision. What we do know is that changes occur, and these changes reduce the habitability of our man/woman made reef environment. It is true that you can go a long time without a water change, which I have done myself - it is easier to do in a large reef tank --, but slowly one begins to notice changes, changes that clearly indicate that the bio-chemical environment for most if not all of the captive reef creatures is declining. For example, some fish begin to show signs of disease, coral's polyp extension decreases, and growth is increasingly limited. More sensitive organisms decline first, making it easy for the reef keeper to ascribe it to something else.

I have been maintaining a reef tank for many years, and can say without hesitation that significant water changes are vital. I prefer less frequent, but larger water changes. To me, 10% weekly is less effective than 30% monthly. However, if you change a large percentage of water be sure to adjust the temperature, pH, and salinity to match that of the water being exchanged.

The Gorgonian in the photograph stopped opening its polyps until I changed over 200-gallons of water last week. Incidentally, this Gorgonian was collected by me in the Bahamas with Julian Sprung and Peter Wilkens almost 20-years ago. Over the years I have given many cuttings from it away, and it currently grows in three different locations in my reef tank. It's very good at telling me when I need to change water.

FEATURE ARTICLE

West Atlantic Stony Corals, Part 3: Large Polyp and Fire Corals

By Jake Adams

Jake continues his West Atlantic Stony Coral series with Meandrinids, Mussids, Oculiniids, Caryophillidae, Hydrocorals, and others.

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Part 3 will discuss Meandrinids, Mussids, Oculiniids, Caryophillidae, Hydrocorals, and others corals.

Meandrinids

Dendrogyra cylindricus is arguably one of the most majestic Carribean corals after *Acropora palmata.* The colonies form very tall, tightly packed upright pillars which may reach six to eight feet in height and almost as wide at the base. The corallites are meandering, long and continuous and they bare fuzzy golden brown polyps which are extended throughout the day. The species doesn't occur in any great abundance but it is very recognizable and hard to confuse with any other species.

Tall upright columns of Dendrogyra cylindricus have long polyps which give the surface a fuzzy appearance.

Dichocoenia stokesi is the species of Meandrinids with the smallest corallites. At first glance it closely resembles Faviid species but it is differentiated by the strongly exert corallites with two cycles of prominent septa. *Dichocoenia* colonies are massive, encrusting or plating in colors of dark to light brown or golden yellow. Colonies are most commonly found at intermediate depths, rarely in shallow water where it tends to be very pale in color. *D. stokesi* is the only recognized species with two general forms. The nominal 'stokesi' form has uniform, small round or oval corallites with only one mouth. The secondary 'stellaris' form has more strongly exert, elongated corallites which sometimes have more than one mouth per polyp.

Meandrina is a group of stony coral with an uncertain taxonomy. The genus contains at least one true species with four recognized forms, one of which was formerly considered a separate genus

Dendrogyra cylindricus with polyps extended on the left column and the polyps retracted on the right column.

Dichocoeania stokesi can be very pale when it occurs in shallow water.

This specimen of D. stokesi with larger, somewhat elongated corallites exhibits some characteristics of the 'stokesi' form.

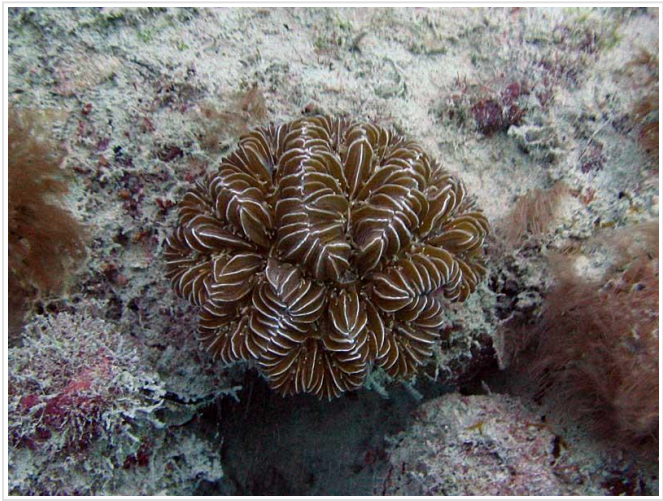
Meandrina meandrites rarely has extended polyps during the day.

altogether. The yellow to brown surface is characterized by deep valleys and strong ridges made up of long, thin, plate-like septa. *Meandrina* colonies are usually between one to three feet across and they occur from shallow to deep reef environments, being most common at intermediate depths. *M. meandrites* occurs as plating, encrusting or submassive colonies. The 'danai' form occurs in deeper water as a smallish, stalked colony. The 'brasiliensis' form is also stalked and it can be found attached or free living in calm sandy substrates where it doesn't reach more than a few inches across. *Meandrina 'brasiliensis'* colonies have an elongated appearance with a long central groove surrounded by a convoluted outer edge. *Meandrina 'memorialis'* departs from the typical *Meandrina* shape by growing into columns which somewhat resemble *Dendrogyra. M. 'memorialis'* has tightly spaced, strongly meandering corallites and this form was previously classified as the single species in the genus *Goreaugyra.*

Mussids

Isophyllia sinuosa is a large polyped Mussid with loosely meandering corallites which bare large fleshy polyps. *I. sinuosa* prefers a

This shallow water Meandrina meandrites colony exhibits a submassive growth form.

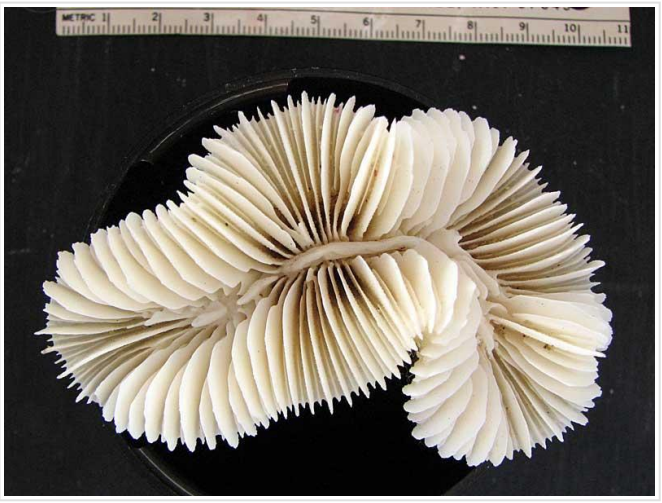


This stalked individual of Meandrina meandrites is known as the 'danai' form.

diversity of shallow environments such as fore reefs where it might be exposed to strong surge or back-reefs where it might experience reduced flow and high sedimentation. The color of the flat or slightly domed colonies is variable between grey, brown, olive or green with pinkish or red streaks and lighter colored polyp interiors. *Isophyllia 'multiflora'* is a growth form with discontinuous corallites and closed polyp valleys. Small colonies of *Mycetophyllia* may be confused with *I. sinuosa* but the latter has a much thicker skeleton and more noticeable polyp tissue. This species somewhat resembles the Pacific Mussid *Symphyllia.*

Isophyllastrea rigida is an unassuming coral which forms small hemispherical or stump shaped colonies. The closely spaced corallites have only a thin margin between them and the polyps are rounded to polygonal in outline. The color is usually a muted brown, grey or green with a pale white or grey polyp valley. *I. rigida* is found in shallow water where it might be common but not abundant. Juvenile colonies have smaller corallites which makes them resemble *Favia fragum* except for the visibly pale polyp interiors. *I. rigida* very closely resembles the Pacific Mussid *Acanthastrea lordhowensis.*

The small stalked or free living Meandrina 'brasiliensis' is often found in shallow or deep sandy habitats.



The close up of this Meandrina meandrites skeleton clearly shows the thin, plate-like septa typical of the genus.

Mycetophyllia is one the most unique coral genera to be found in the wider Caribbean. Some species of *Mycetophyllia* may resemble the unrelated Pacific *Echinophyllia* except the former has much larger features and structure overall. The species within this genus have a generally flattened colony shape which may encrust the substrate or they may grow plates where the reef structure falls out. The species are mostly identified by the characteristics of the prominent ridges which border long rows of conspicuous corallites. Like many Atlantic Mussids, *Mycetophyllia* tends to be more abundant in intermediate to deep reef environments.

Mycetophyllia aliciae has few large ridges which are sparse towards the interior of the colony and mostly absent in the center. The valleys are widely spaced with two to three polyps between the discontinuous ridges. The perimeter is conspicuous and puffy with folds irregularly growing inwards. The corallites of *M. aliciae* are large for the genus and they are adorned with bright white

This stumpy colony of Meandrina meandrites is an example of the 'memorialis' form.

This shallow water specimen of Isophyllia sinuosa was found on a back reef with reduced flow, turbid water and a high degree of sedimentation.

nodules which contrast with the darker brown or grey polyp valleys. The ridges sometimes exhibit colorful nodules which make them stand out from the rest of the colony.

Mycetophyllia ferox is one of the more easily recognized species in the genus. The small, closely spaced ridges contain a single file of brightly colored mouths within a narrow polyp valley. *M. ferox* colonies display a bewildering assortment of colors with bluish purple ridges, teal to green valleys and orange, pink or red bumps surrounding the polyp mouths. The growth form of *M. ferox* is mostly plating with an overall thinner skeleton and smaller features than other species in the *Mycetophyllia* genus.

Mycetophyllia lamarckiana is somewhat intermediate in features between *M. aliciae* and *M. ferox*. Colonies are encrusting of plating with moderately spaced, meandering ridges which can be continuous or broken into independent ridges and nodules. The darkly colored valleys are contrasted by lighter colored ridges. *M. lamarckiana* is not common but it is most abundant in water that is shallower than other species in the genus.

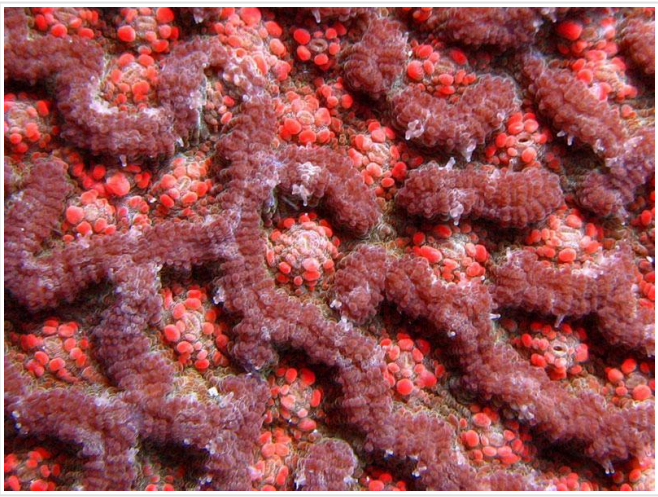
The green polyps and red-streaked ridges of this Isophyllia sinuosa was a common color combination for the species around Puerto Rico.

Isophyllastrea rigida colonies become increasingly dome-shaped or hemispherical as they grow larger.

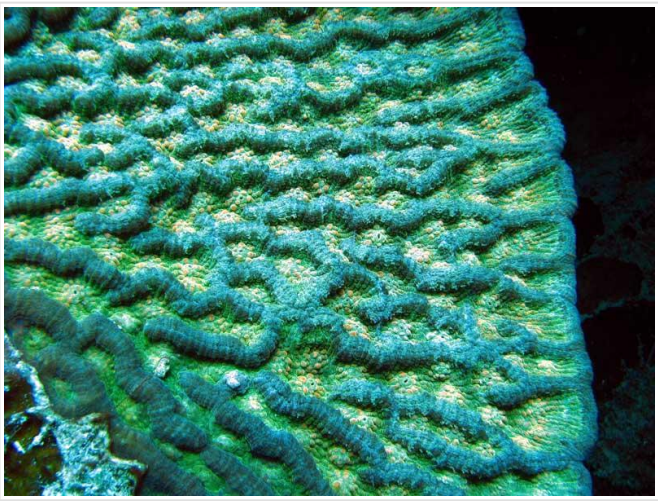
The inset features a juvenile colony at about half the scale of the larger image.

Mycetophyllia comes in a veritable rainbow of colors..

Mycetophyllia aliciae has few and widely spaced ridges and lightly colored, contrasting bumps around the polyp mouths.



Mycetophyllia ferox often has very conspicuously colored bumps surrounding each polyp mouth.



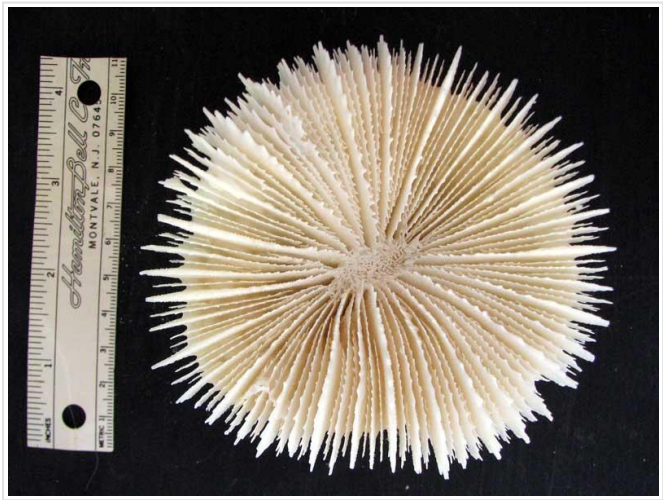
This specimen of M. ferox was photographed at intermediate depth without the use of flash

Mycetophyllia lamarckiana often has contrasting polyp ridges and valleys.

Scolymia is a recognizable genus to many reef aquarium keepers as the Pacific species are very popular. There are at least two species of *Scolymia* in the west Atlantic Ocean, both of which are as colorfully adorned as their Pacific counterparts. The polyp of the larger *Scolymia lacera* reaches up to ten inches in diameter when fully extended although they are more typically about six to eight inches across when fully grown. The species can occur in calmer shallow water habitats but it is much more common at intermediate depths, often attached to vertical reef faces. The colors of *S. lacera* can be a muted grey, green and red but some specimens exhibit a darker base color with brilliant red lines radiating from the polyp mouth. Some coral taxonomists believe *Scolymia lacera* to be the solitary form of the colonial *Mussa angulosa.*

Scolymia cubensis is usually found in deeper and cryptic habitats where it grows as a single, neatly circular polyp up to three inches in diameter. The surface of *S. cubensis* is smoother in appearance than the larger *S. lacera*. The color of *S. cubensis* is a mostly uniform green, red or brown with very little mottling or patterning and it may or may not fluoresce. Juvenile *Scolymia* polyps cannot

This strikingly colored Scolymia lacera is nearly ten inches across.



Scolymia lacera is the only solitary coral polyp in the Caribbean that grows over 4"/10cm in diameter.

be reliably identified without careful examination of the skeletal features.

Mussa angulosa is a relatively uncommon coral on West Atlantic reefs but it is very easily recognized. Colonies are composed of large fleshy polyps which have a rough textured surface. The polyps are circular with a single mouth or uneven in outline with multiple polyps. The overall colony shape is flat or hemispherical and they are usually found at intermediate depths. Colors are usually a muted grey or brown with hints of green and red but they can also be colorfully pink or red. *Mussa angulosa* closely resembles some of the large polyped species of *Lobophyllia* from the Pacific Ocean.

OCULINIIDS

Oculina is a group of stony corals occurring in seas throughout the world. The family Oculiniidae also includes the more familiar *Galaxea* corals which are regularly available to aquarists. *Oculina* species are mostly non-photosynthetic with certain species being *facultative heterotrophs* meaning that they may or may not occur with zooxanthellae and they may experience seasonal fluctuations of zooxanthellae densities. Many species of *Oculina* are commonly found associated with deed sea reef formations and at least two species are commonly encountered in shallow water environments of the West Atlantic.

Oculina robusta is an unusual coral which prefers turbid shallow water environments. *O. robusta* is only found in Tampa Bay and the western coast of Florida and as a result it is commonly imported on the live rock which is cultured in the area. The species grows very sturdy, tapering branches from an even wider base. The large corallites have protruding rims and they are tightly spaced towards the branch tips and widely spaced towards the base. The color is a uniform dark brown with a surface that appears almost shaggy when the polyps are fully extended.

Unlike *O. robusta, O. diffusa* has a much more widespread distribution throughout the Caribbean. *Oculina diffusa* has much thinner branches which are very closely spaced giving the colony a thicket-like appearance. *O. diffusa* occurs in shallow lagoon and calm reef environments and it is frequently found growing

Scolymia cubensis is very difficult to identify without close examination.

Mussa angulosa has the largest polyps of any colonial coral in the western Atlantic.

Scolymia cubensis remains quite small as compared to other Scolymia species.

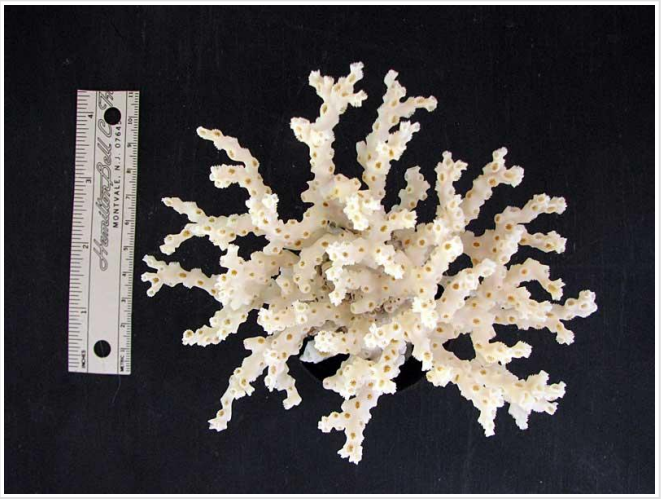
Oculina robusta has a thick, tree-like growth form. The conspicuous polyps are retracted in this photograph.

among seagrass or on shipwrecks. The species can be deep brown when it is exposed to sunlight or it can be ghostly white if it is shaded or growing in a cave or overhang. *Oculina* diffusa colonies do not grow very large because the old skeleton is often dead and covered by encrusting organisms which accelerate the bioerosion of the delicate branching structure.

CARYOPHILLIDAE

The coral family Caryophyllidae is represented in the West Atlantic Ocean by many small solitary and colonial species, only one true reef-building species and perhaps the first documented case of an introduced stony coral species. *Cladocora arbuscula* is a small branching, photosynthetic species. The brown to golden brown colonies of *C. arbuscula* can grow in tight clusters or as loose tangles. *Phyllangia American* grows usually as a single medium sized polyp. *P. Americana* is non-photosynthetic, with clear tentacles and a hint of reddish marking around the mouth. *Tubastrea coccinea* is familiar to most reef keepers as sun coral. This coral is normally found in the Pacific Ocean but beginning in the 1940s, this coral started being sighted on Dutch Caribbean reefs.

Oculina diffusa is commonly found growing in calm back reefs amongst seagrass blades.



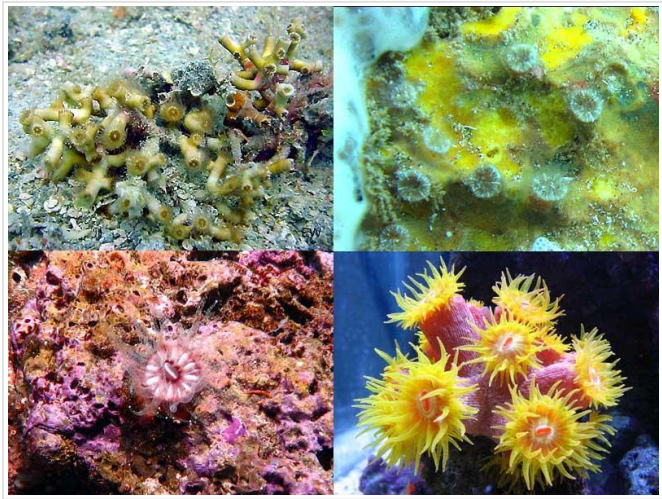
Oculina diffusa has a thin, delicate branching pattern.

Sun coral is believed to have been introduced by hitching a ride on the bottoms of shipping boats from the Pacific and it has since spread from the Lesser Antilles to the Texas Flower Garden Banks.

Eusmilia fastigiata is the only Caryophyllid in the West Atlantic Ocean which is an important reef-building coral. *E. fastigiata* colonies form hemispherical mounds of stalked polyps which appear to originate from a central point. The greenish or brown polyps are retracted during the day, revealing prominent septa on the circular to oval corallites. This species is most common in shallow to intermediate reefs which are somewhat protected from strong water movement.

HYDROCORALS

Although Hydrocorals are not true corals, no review of Atlantic corals would be complete without at least describing this important group of reef building animals. As the name implies, fire coral



Top left, Cladocora arbuscula, Photo by Ernesto Weil. Top right, Astrangia solitaria, not a Caryophyllid. Bottom left, Phyllangia americana. Bottom right, the familiar sun coral, Tubastrea coccinea.

Eusmilia fastigiata is the only important reef-building Caryophyllid.

Millepora alcicornis tends to branch in a single plane.

It is much less common for Millepora alcicornis to branch on its own than to encrust an exisitng structure such as the remains of this sea fan skeleton.

Millepora complanata is recognized by its fused, blade like growth form.

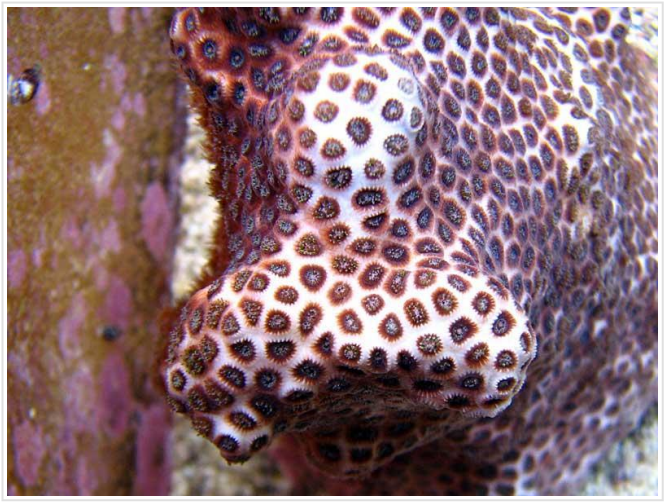
has a potent sting that feels like a burning sensation to human skin. The major group of Hydrocorals is fire coral in the genus *Millepora.* Fire coral has a very dense skeleton covered by brown to golden tissue which is pale at the growing edge or tip. The two most common species are *M. alcicornis* and *M. complanata. Millepora alcicornis* is a thin branching species which is found in shallow to intermediate water. The branching pattern tends to remain in a single plane but *M. alcicornis* also aggressively encrusts the substrate. *M. alcicornis* is often seen encrusting gorgonian skeletons, sometimes so faithfully that every little vignette of a sea fan remains visible. *Millepora complanata* grows as a succession of short, sharp blades. *M. complanata* is a very sturdy species which is common in very shallow reefs where it is exposed to strong wave action.

ADDENDUM

Solenastrea is a genus which was mistakenly omitted from the overview of West Atlantic Faviids in the previous article. The genus includes two species and it is characterized by

Millepora complanata forms very dense aggregations especially in shallow water where it is exposed to strong surge.

Solenastrea bournoni forms golden brown hemispherical mounds which exhibit an uneven surface.



The light colored tissue and dark colored polyps of Solenastrea hyades give the surface a spotted appearance, especially when the polyps are retracted like in this specimen.

intermediate sized polyps which are extended throughout the day, giving the surface a fuzzy appearance. *S. bournoni* is common in a wide range of habitats. The colonies are massive to hemispherical, with a golden brown and somewhat irregular surface. The corallite rims are irregularly spaced and noticeably exert from the surface. *S. hyades* also grows in a wide range of environments but it is particularly abundant in shallow turbid environments which are subject to a high degree of sedimentation. This species grows colonies which are hemispherical and columnar in shape with conspicuous bulges and finger-like projections eventually developing on the top side of colonies. The polyps are dark and widely spaced with pale to white tissue in between them, giving colonies a spotted appearance when the polyps are retracted.

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FEATURE ARTICLE

Top Down Photographing Techniques and Equipment for Corals in a Reef Aquarium

By Sanjay Joshi

This article will explore some of the cheaper options that will allow an aquarist to take stunning top down pictures of corals in the home aquarium with both simple point and shoot cameras and the more expensive SLR cameras.

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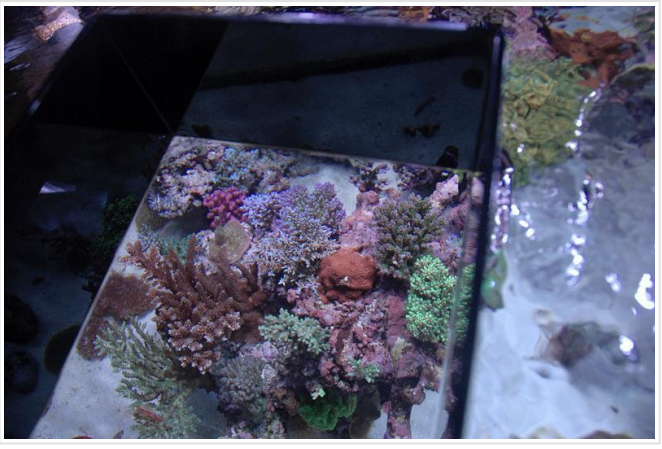
Every reef aquarist has observed that corals in the aquarium look the most colorful and vivid when viewed looking down into the tank from the top of the aquarium. Often this view is obscured by the rippling surface of the water and reflections of the light from the water surface, making it difficult to view from the top. The only recourse was to turn off the water flow and wait for the surface to get still. Taking pictures from this top view was quite a challenge as even small ripples would distort the surface enough to ruin a perfectly good picture. The alternative was to invest in underwater cameras that allow submerging the entire camera into the aquarium, or encasing the camera in expensive underwater housings. While these are well suited for diving applications, it is quite expensive to purchase an underwater camera or a housing just to be able to take pictures of corals in an aquarium.

This article will explore some of the cheaper options that will allow an aquarist to take stunning top down pictures of corals in the home aquarium with both simple point and shoot cameras and the more expensive SLR cameras. The common denominator in these options is to provide the ability to shoot pictures from below the water surface, thereby eliminating the effects at the air water interface that lead to picture distortion.



Using a surface Viewing Box

To enhance the top down viewing experience and allow for taking pictures from this view surface viewing boxes can be designed to eliminate this effect of the water rippling and surface motion. This in its most simple incarnation is a clear flat bottomed sheet of acrylic or glass with side walls. By immersing the viewing box into the water without getting water into the box once can get a clear view without being affected by the surface effects. This is essentially the same concept used by glass bottom viewing boats. Figure 1 shows a commercially available surface viewing box (available through Dr. Foster and Smith). As you can see, the view within the box is clear while the effects of the water surface are visible outside the box.

Using a camera, one can now take pictures of the view of the corals within the box. A major drawback of this technique is that it often requires the use of two hands - one to hold the box in place to prevent it from drifting away and another to handle the camera. A small point and shoot is easier to handle using one hand as compared to a heavier and bulkier SLR. Although this can be made to work, it is not the most convenient method.

Camera Mounted View Box

The same concept can be further extended to enable capturing some of the incredible top down views by building simple view boxes for the camera. The key is to attach the box to the camera so as to keep the lens dry when the viewing area is submerged, and to create a large enough viewing area so the walls do not show up in the field of view.

There are several creative variations of this basic concept that can be used, depending on the type of budget, sophistication and elegance required. All these rely on the basic idea of keeping the camera and lens dry while allowing partial submerging to break the air water interface.

Figure 1. Top Down Camera Box - pictures curtsy of Marc Levenson

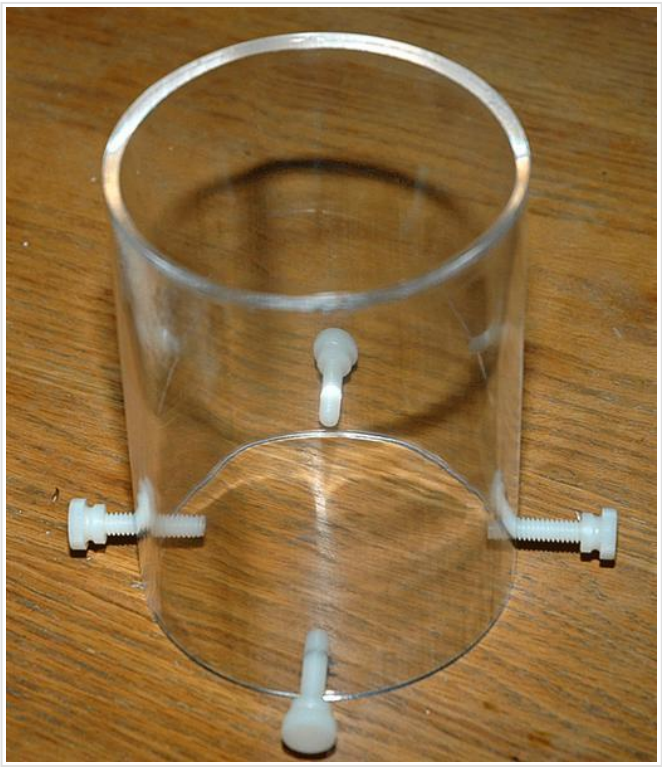


Figure 2. Picture tube built by Gustavo Pagnozzi

Box

BOX - this is typically a rectangular box constructed with acrylic, with clear or darkened side walls similar to a surface viewing box. One side is made longer with a screw in it to allow it to be attached to the camera via the tripod mount hole. The box can be made small enough to allow the lens to fit comfortably, or larger to allow the use of your hand for manual focusing. Figure 1 a and 1b shows a typical camera box. This one is made by Marc Levenson. In this design, the long side of the box is bent into a U shape to allow the box and camera to be stabilized against the edge of the tank. This also allows some degree of safety in preventing the box from accidentally getting submerged and filling up with water.

Tube

TUBE - Another simple variant is to use a cylindrical tube instead of a box. This makes for much simpler construction. The tube is

Figure 3. A cheap version of the top down box designed by Micheal Bollinger

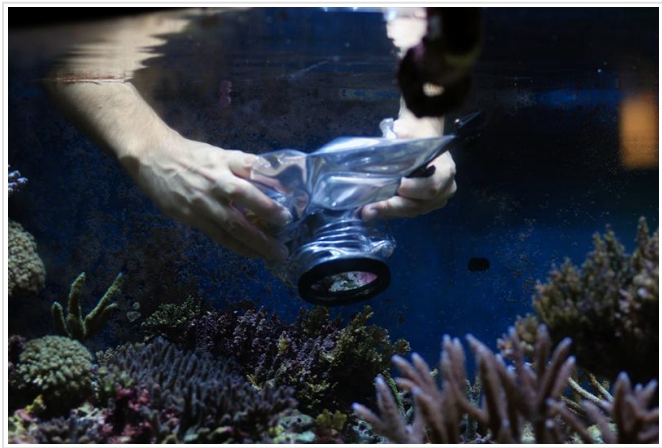


Figure 4. EwaMarine soft water proof bag in use by Jake Adams for taking Top down pics in the Penn State Aquarium. Photo by Gresham Hendee.

sized to be slightly larger than the lens diameter. Nylon screws are used to hold the tube on the camera lens instead of mounting it to the camera's tripod mount. Figure 2 shows an example of a picture tube given to me by a Boston Reefers club member - Gustavo Pagnozzi. This is currently being used by me on my Nikon D70 SLR camera to take the pictures shown in Figure 5.

Both designs work equally well, and are easy to construct and use. Mounting the tube on the lens allows for manual focusing if the tube is mounted on the camera's focusing ring. However, this approach will not work well with the point and shoot camera's where the lens diameter is rather small and the lens retracts into the camera when turned off.

Before using, it is very important to pretest the devices for water proofing, and make sure that the seams are sealed well enough to avoid leaks. Make sure the bottom surface is clean and scratch free. Additionally since these are open be very careful to ensure that you do not submerge the box deep enough to have water go into the box and damage the camera and/or lens.

Figure 5a: Top Down pictures taken using the Picture tube

Figure 5b: Top Down pictures taken using the Picture tube

3) Cheap 'Ghetto' Version of the Top Down Box

GHETTO - Figure 3 shows a cheap version of the top down box made with Tupperware and plexiglass, designed by Michael Bollinger. Details on construction can be found in this thread on reefs.org (http://reefs.org/phpBB2/viewtopic.php?t=105955). Functionally its servers the same function, allowing the user to submerge the viewing box and keeping the camera and lens dry.

Taking Pictures

Once you have the box (or its variants) mounted on the camera, the following techniques can be used to take the pictures. Keeping the bottom pane submerged use the autofocus capability of the lens to focus on the corals and take the pictures. To get more close up pictures use a macro lens. Make sure that you keep the

Figure 5c: Top Down pictures taken using the Picture tube

Figure 5d: Top Down pictures taken using the Picture tube

inside of the box free of water at all times, else you may make the lens wet and damage it with the salt water. Also make sure the camera is held securely in your hand while taking the pictures. Use the camera strap to further ensure that the camera will not accidentally fall into the aquarium. Stand on a firm stable surface and do not lean too far over the tank so as to fall off balance. Often the lighting system may get in the way. Depending on how the lights are mounted you may be able to move it higher. Usually with the aquarium lights on, you will have enough light to take pictures without any additional lighting. Turn the waterflow off if you want to make sure that the polyps are still and moving polyps are causing blurriness due to slower shutter speeds and/or hand shake. If additional lighting is desired, you can use an external flash.

OTHER TECHNIQUES

There are several relatively cheap plastic water proof soft camera bags that can be used with point and shoot cameras and also with SLR. These bags are made by several companies, such as DiCAPac (www.dicapac.com) and Ewa-Marine (www.ewa-marine.com). Additional advantage of these bags is that they allow the complete camera to be submerged and allow for more flexibility of shooting in an aquarium, with less concern of flooding the photo box. The also provide clear optical quality material windows to take pictures through the bag. These soft bags are designed for underwater photography. When used in an aquarium they are a lot easier to use with camera's that support live view (pretty much all point and shoot camera). With most of the current generation of digital SLRs live view is not an option and view through the viewfinder is not an option when the camera is submerged. In this case, the only option is to rely of auto focusing and some guess as to what the camera is seeing.

Figure 5e: Top Down pictures taken using the Picture tube

FEATURE ARTICLE

Home Fumigation - Do I Really Have To Remove My Aquarium?

By Dana Riddle

Dana's limited experiences suggest you and your aquarium will make it through just fine.

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Fumigation is a means to control pests by enclosing a structure within a 'tent', injecting a gaseous pesticide and allowing the poison time to infiltrate nooks and crannies, thus killing targeted vermin. In Hawaii, using the pesticide Vikane™ (Dow AgroScience's trade name for sulfuryl fluoride - F_2O_2S) is most often used to eliminate drywood termites. It is also used on the mainland to control other drywood termite species. Fortunately, drywood termites do not occur in all states and are restricted to warmer climates. But they can be a real problem in coastal North and South Carolina, south Georgia, Florida, south Alabama, coastal Mississippi, Louisiana, Texas, New Mexico, Arizona and southern California.

Licensed pest control specialists generally recommend removal of aquaria from the structure but *might* allow an aquarium to remain inside during treatment (using, of course, aeration from an air pump situated well away from and outside the building). They are doing what they are trained to do - recommend to the customer the best options for their pets. In fact, little is known about the effects of this pesticide on many animals. Indeed, Kollman (date unknown) states that effects of Vikane on fish, wildlife and other non-target organisms are not known.

Hawaii is a land of eternal summer where killing frosts don't occur (unless you're living on the peaks of the Big Island's Mauna Loa, Mauna Kea or Maui's Haleakala). Hence, invertebrates such as corals thrive, but less desirable inverts such as termites and wood-boring beetles also enjoy the sub-tropical climate, and these pests aren't particular - they live in humble, ramshackle coffee shacks all the way up to multi-million dollar homes. While my home is decidedly somewhere-in-between, several termite colonies were quite content to dine on its wooden frame. Professional help was needed.

My fears were confirmed when the inspector recommended I remove 4 aquaria from the house. This would be a major project! I considered leaving the tanks in the house and simply supplying 'clean' air from outside, but rejected this notion. Instead, at almost the last minute, I decided to conduct a few experiments to determine the effects of the pesticide on a few selected invertebrates. Although this may sound cruel, I knew that moving the animals to an outside home and back again also involved risks to the health and lives of the captive animals. Perhaps something could be learned from this ordeal.

The evening before the scheduled fumigation, I removed a few invertebrates from aquaria and randomly placed them in ten Mason jars containing 750 ml of aquarium water (see Figure 2). Five jars would be left uncovered and aerated from an air pump within the house. This would be the worst case scenario, where nothing was done to prevent the pesticide from making contact with the water and its inhabitants. Another five jars would be covered with two pieces cut from nylon polymer bags (NyloFume™, Dow AgroSiences) which are impermeable to Vikane. These were supplied by the exterminator to bag food, medicine and other goods from exposure. Aeration to these five containers was supplied by an air pump situated well away from the tented house.

Since the air conditioner would have to be turned off during fumigation, I had concerns about the temperature of the jars' contents getting too high. I monitored air temperature and water temperature in one of the covered jars with a datalogger (WatchDog™ model 425, Spectrum Technologies) as well as light intensity (using a Spectrum PAR sensor modified for 60 Hz light). pH and temperature were monitored in an uncovered jar with a separate datalogger (Hach HQ40d™ multi-meter). Fluoride (as F^-) was measured using the SPADNS method and a Hach DR890 colorimeter (chloride concentrations exceeding 7,000 mg/l and sulfate exceeding 200 mg/l will cause high results, and distillation is recommended. This was not done, however it is assumed that there was no difference in the aliquots since they were originally from the same source. Hence the measurements should be valid for comparative purposes).

Figure 1. "Tenting" a house for drywood termites. The tent contains the toxic gas within the structure.

RESULTS

None of the inhabitants of the covered jars suffered any apparent harm during fumigation. Results were different for some of the invertebrates exposed to the gas. Woven Topsnails (*Trochus intextus*) seemed particularly susceptible to the effects of fumigation and succumbed within 24 hours. Vikane was also deadly to Spiny Brittle Stars (*Ophiocoma erinaceus*), Ten-lined Sea Urchins (*Eucidaris metularia*), and Rock-boring Sea Urchins (*Echinometra mathaei*), but the effects were not immediate and the animals perished over the course of several days. Rock Anemones (*Aiptasia pulchella*) and an unidentified zoanthid (*Protopalythoa* sp.), were 'burned' during the fumigation event but survived (see Figures 3 and 4) and recovered in about 1 week. A green alga (*Ulva*) and unidentified red algae also survived exposure with no apparent harm or loss of photopigments.

Figure 2. The experiment's set up. Air temperature, water temperatures, photosynthetically active radiation (PAR) and pH were monitored.

Figure 3. One of the Aiptasia anemones before fumigation with sulfuryl fluoride.

DISCUSSION

When examining the possible effects of sulfuryl fluoride on invertebrates, we must consider that another agent is also used during fumigation - chloropicrin. This is a warning agent (a 'tear gas') released in trace amounts into the structure to drive out people or animals the inspector might have missed (there's a scary thought).

Sulfuryl fluoride is soluble in water (solubility = 750 ppm), and in alkaline water (including seawater) it undergoes rapid hydrolysis and forms fluorosulfuric acid (HSO_3 F) and fluoride. Hence we

Figure 4. The typical appearance of Aiptasia anemones after exposure to sulfuryl fluoride and chlorocipin. They appear to be 'burned'.

would expect to see a drop in pH when Vikane dissolved into the water - and this was noted in the open jar monitored for pH. See Figure 5.

Additionally, we would expect to see an increase in fluoride in the 'exposed' water. This, too, was noted - several days after fumigation, elevated fluoride was found in the water of the jars exposed to the fumigation gases. Natural seawater is used and the covered jars contained ~1 mg/l fluoride while the 'exposed' jars contained an average of 2.2 mg/l fluoride.

Air temperature and hence water temperatures stayed within an acceptable range during the experiment. See Figure 6.

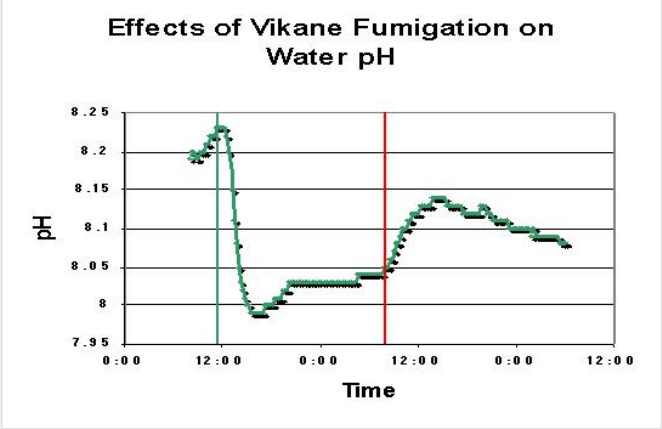

Figure 5. Water pH fell sharply when chlorocipin and sulfuryl fluoride were released into the structure. The green line marks the beginning of fumigation, and the red line is when the 'tent' was removed and structure ventilation began.

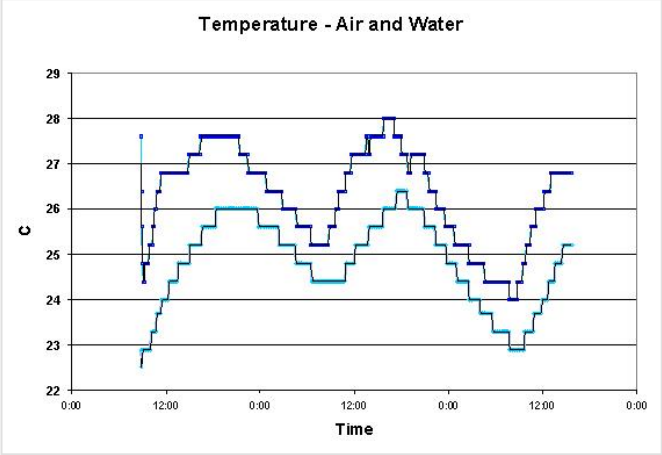

Figure 6. Air and water temperature during the experiment.

Photosynthetically active radiation stayed at low values during the 12 hour photoperiod. Inadvertently, PAR records indicated exact times the tent was placed on and removed from the structure (the jars were situated near a window; data not shown).

Dissolved oxygen was not measured in the jars but aeration was probably sufficient. Further, decaying matter exerts an oxygen demand and none of the containers with mortalities generated any signs of anoxic or anaerobic activity (judged visually and by smell).

The results from this brief experiment suggest that temperature and pH modulations were not severe enough to cause distress or death in the affected animals. However, swings in these parameters correlated exactly with the release of the pesticide and its warning agent. Further, elevated fluoride levels found in the 'open' containers several days after exposure suggest sulfuryl fluoride did contribute to the demise of the marine invertebrates.

On a happier note, the specimens in the covered and aerated containers suffered no mortalities. This suggests that covering an aquarium with NyloFume™ bags and providing aeration from a source outside of the affected structure is sufficient to prevent contact with either the warning agent or pesticide.

Based on this evidence, I'll elect to keep the aquaria inside the house and exercise all due precautions next time fumigation is needed. I lost a captive-bred Flame Angel due to stresses of moving him about (and not due to any effects of the pesticide). In retrospect, I should have simply covered the tanks and maintained good aeration and water circulation. If you find yourself in the same situation, where sulfuryl fluoride is the fumigant, perhaps you should consider this too. Discuss this with a licensed professional and reach an understanding first. My limited experiences suggest you and your aquarium will make it through just fine.

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FEATURED AQUARIUM

15 Gallon Freshwater Planted Tank

By Charles J. DeVito

Even in this day and age of exorbitantly colored, ridiculously expensive, inordinately rare corals with over-the-top names like Reverse Radioactive Green Monkey Nipple zooanthids, there's still not much that compares to a school of neons swimming amongst a lush aquatic meadow.

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I stopped keeping freshwater tanks and started keeping saltwater aquariums back in the mid-'80s and set up my first reef tank in 1996. As much as I loved the reef hobby, by the summer of 2007 I decided my conscience simply wouldn't allow me to continue with it. It left me with a dilemma, though, as I loved keeping aquariums and had been doing so for nearly my entire life. In the end I decided to return to the freshwater tanks I'd left behind long ago, and to explore a segment of that hobby that was only in it's infancy way back then, the freshwater planted aquarium.

After a few months of research and gathering parts and supplies, on 10/4/2007 I started up a 15 gallon freshwater planted aquarium. In the months since then I've been amazed at how much I'm enjoying this tank. There's hardly any maintenance involved, and I'm continually surprised by just how easy it is to be successful with it. More than that, I'm genuinely excited by the possibilities of what you can do with this sort of tank, and that's an excitement I haven't felt about reef aquariums for a long time now. These tanks are about as far from the fruitstand style of most reef aquascapes as you can get.

Best of all, I get to enjoy my hobby without needing to justify it to anyone, least of all myself.

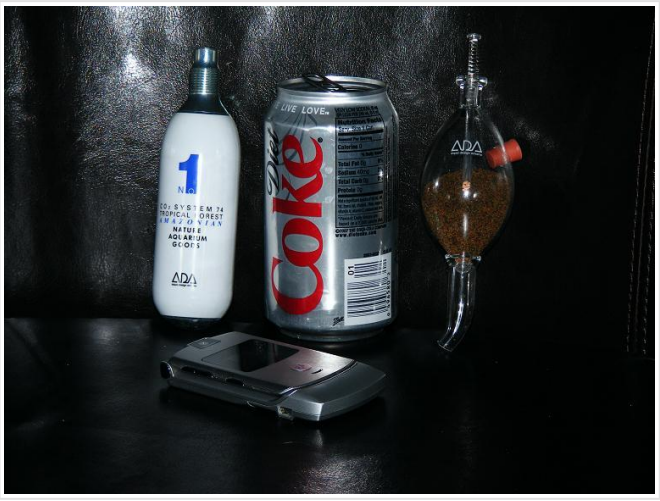
Equipment

- 15 gallon All-Glass aquarium (24"x12"x12")
- 4 x 24w T-5 lights (6700K)
- Eheim 2213 canister filter
- Hydor in-line heater
- Aqua Design Amano System 72 pressurized CO^2 and solenoid
- Aqua Design Amano bubble counter, diffuser and drop checker
- Aqua Design Amano substrates (Tourmaline, 2 liters of Power Sand, 12 liters of Amazonia soil, 3 liters of Amazonia powder)

I chose a 15 gallon tank for this set up because I felt it offered me a large enough volume to create an attractive aquascape, while at the same time being small enough still that maintenance would be very quick and simple to perform.

The ADA System 72 pressurized CO^2 is designed for use on small tanks. Rather than use a large, refillable CO^2 canister, it instead employs small, disposable 72 ounce cans of CO^2. While not as economical in the long run as a traditional 5 lb canister, these disposable cans are tiny, easy to hide from view and very convenient. I maintain around 30 ppm of CO^2 in my tank, and at that rate one of the disposable cans lasts me just a little bit longer than two months. CO^2 is dispersed via a pollen-glass diffuser, and the concentration of CO^2 in the water is monitored visually with a aid of a drop checker (a nifty little device which displays at a glance if you've got too little, too much, or just enough).

Very little equipment intrudes into the tank itself. The intake and return from the canister filter are positioned in the back left corner, effectively hidden by the plants. The diffuser is partially obscured by the hairgrass at the rear of the tank, and only the drop checker sits out in plain view.



CO2 can.

Drop Checker

Diffuser

Design Philosophy

After seeing photos of tanks that featured a "lawn" of *hemianthus callichtroides*, I knew that was what I wanted to do. Although I was intrigued by the Iwagumi ("stone garden") approach currently popular in aquascaping circles, I opted instead to try to recreate the feel of a small meadow at the edge of a forest. As the tank I'm using is only a 15 gallon, one of the biggest challenges was giving it the illusion of being much larger than it actually is. The open, negative space in the layout helps with that goal, as does the fact that all of the plant species used have tiny, delicate, fine foliage.

Tank Set-Up and Evolution

I began with 10 pots of *hemianthus callichtroides "cuba"* (more commonly known as HC), 8 pots of hairgrass (*eleocharis acicularis*), 12 *blyxa japonica* and several bunches of *ludwigia repens*. On day one, things looked rather sparse. I had expected the 10 pots of HC to cover more volume than they actually did, and was a bit worried at first because the plant has a reputation for taking some time to get going when introduced to a new tank. The hairgrass looked pretty bad initially as well. Fortunately, just three weeks later both had shown significant growth and had spread a great deal. By the six week mark, the HC lawn had completely filled in.

Also at the six week mark I made my first changes to the aquascape, removing the *ludwigia repens* and replacing it with some java fern and *anubias nana var. "petite"*, both tied down to a stump of driftwood placed where the ludwigia had been. I found I wasn't happy with the finished result, however, and a few weeks later I removed those new additions and replaced them with several bunches of *myriophyllum pinnata* and a dozen or so stems of needleleaf ludwigia (*ludwigia arcuata*).

Fish

- Threadfin rainbowfish *(iriatherina werneri)*
- Spotted Blue-eyes *(pseudomogil gertrudae)*
- Golden Lyretail Killifish *(aphyosemion australe)*
- Otocinclus catfish *(otocinclus affinis)*
- False Siamese Algae Eater *(epalzeorhyncus* sp.)

Maintenance

Surprisingly little is required. My daily routine is just feeding the fish and adding fertilizers. Once a week or so I trim the plants. That mostly consists of topping the stem plants and, every now and then, mowing the HC "lawn". Every few weeks I perform a 5 gallon water change, and once every few months I give the canister filter a cleaning.

Things I'd Do Differently

This tank has been a learning experience, and as such it's taught me a few things the hard way. Chief amongst them is that mixing HC and hairgrass, while very attractive and effective, is a royal pain. The hairgrass spreads by runners that are often as much as an inch below the substrate, which means hairgrass runners are continuously spreading below the HC lawn. Stems of the hairgrass poke through the HC and require regular removal. If I were to try to use both species in the same tank in the future, I'd use thin sheets of acrylic as dividers in the soil. That way I could keep the hairgrass "caged" and keep it's runners out of everything else.

Threadfin rainbowfish (iriatherina werneri)

Spotted Blue-eyes (pseudomogil gertrudae)

Golden Lyretail Killifish (aphyosemion australe)

Acknowledgements

I'd like to thank Robert Hudson of AquaBotanic, the source of nearly all the plants I've used, as well as Jeff Senske of Aquarium Design Group from whom most of the hardware and supplies were purchased. Both these gentlemen and their companies were very helpful as I got this project started.

I also owe a large "thank you" to Roy Deki of the Arizona Aquatic Plant Enthusiasts. Photos of his planted tanks provided me with the inspiration to begin my own, and the *ludwigia arcuata* stems currently in my tank were sent to me as cuttings from his.

Closing Comments

I'd like to encourage the reefing community to give these tanks a try. If you're beginning to feel burnt out on reef keeping, planted tanks offer a beautiful alternative that doesn't involve nearly the amount of work and expense of a reef. If you're having qualms about the morality of the marine ornamentals industry and the health of the world's reefs, the planted tank hobby is the perfect substitute. They also don't require reef-tank levels of patience; even the slowest growing of aquatic plants grows more quickly than the fastest growing of corals. They're appealing; I'll tell you honestly that non-aquarists seem to enjoy a planted aquarium more than they ever enjoyed my reef. They're warm and inviting; a planted tank looks much more natural in any décor than a reef tank does. Where reef tanks can appear alien and eerily blue, the planted tank radiates warmth in shades of green and red and yellow.

Besides, even in this day and age of exorbitantly colored, ridiculously expensive, inordinately rare corals with over-the-top names like Reverse Radioactive Green Monkey Nipple zooanthids, there's still not much that compares to a school of neons swimming amongst a lush aquatic meadow.

Otocinclus catfish (otocinclus affinis)

REEFKEEPING EVENTS

What's Happening in Your Area?

By Advanced Aquarist Readers

Check to see if an event is happening in your area!

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Do you have an upcoming event?

If so, please email us at feedback@advancedaquarist.com and let us know about it!

International Marine Aquarium Conference '08, May 30 - June 1

Date: Friday, May 30 through Sunday, June 1, 2008
Location: Crowne Plaza Hotel, Chicago O'Hare, 5440 North River Road, Rosemont, IL 60018, USA
Website: http://www.theimac.org/

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East Tennessee Reef Club Frag Swap, June 14

Date: Saturday, June 14
Time: 12:00 PM - 4:00 PM
Location: Fellowship Church, 8000 Middlebrook Pike, Knoxville, TN 37909
Website: http://www.easttnreefclub.com/fragswap.html

Come visit our first annual Frag swap! You can buy, sell, or trade your frags. There will be a Raffle, Fragging demo, and much more. Admission is free. We can't wait to see you there!

Doctors Foster and Smith and LiveAquaria.-com 4th Annual Coral Conference & Frag Swap, June 20 - 22

Date: Friday, June 20 through Sunday, June 22, 2008
Location: Doctors Foster and Smith, N River Rd, Rhinelander, WI 54501
Website: http://www.drsfostersmith.com/General.cfm?c=3578&gid=400

Join us in Rhinelander, Wisconsin for a one-of-a-kind experience with over 500 fellow hobbyists! There will be expert speakers, industry experts and exhibitors, frag trading, auctions, activities for the kids, **$20,000 in prizes given away**, and much more! PLUS, don't miss a tour of our Aquaculture Coral & Marine Life Facility and Call Center & Warehouse - we only open them up to the public once a year! Sign up soon to get your choice selection of tour times.

New this year:

- More speakers, and more sessions starting on Friday
- Exhibitor booths opening on Friday
- New informal "meet & greet" reception on Friday evening
- Frag Swap on both Saturday AND Sunday
- Improved raffles, improved registration, and improved (cooler!) exhibitor & trader facility

For more information, please visit their website for directions, schedule of events, and other information.

Reefkeepers Weekender, August 29 - September 1

Date: Friday, August 29 through Monday, September 1, 2008
Location: Pontins, Pakefield, Suffolk (2 hours from London, 3 Hours from Birmingham)

The Reefkeepers Weekender has grown steadily since it's inception, and last year was a really fantastic weekend, with superb presentations, a Quiz, brilliant raffle prizes, cabarets, plenty for the kids, and LOTS of late night chat (and a fair bit of Resolve sold in the shop!).

The highlight of the weekend will be, in additon to the usual raffle and quiz, presentations by none other than world renowned experts:

- Mr Anthony Calfo, Author of two of the "Bibles" of reef keeping, "The Book of Coral Propagation" and "Reef Invertebrates" amongst others. Anthony has also recently had articles in "Ultra Marine" magazine.
- Top Dutch expert, Mr. Ron Hessing. Ron writes for Koralle magazine in Germany, A Journal in the USA, and his own site www.marineaquarium.nl and has spoken publically at events around the world, most famously, MACNA and the Boston Reefers Society.

As well as these eminent experts, there will be other presentations, to be confirmed. Details of what their presentations will be will follow a bit nearer the time.

It is essential that you book now if you want to come this year. Last year, the holday park was full, and some of those that wanted to come were disappointed. So, don't delay your decision this time people. It is bound to be over subscribed with a line up like this, so get in there and secure your place. You need to contact Pontins, Pakefield to book on 01502 502 900. Tell them it is for the Reefkeepers Weekender, and make sure you give them your UR name as well your real one, so that we can issue badges.

For 3 nights Fri, Sat and Sun, it is £60 and half price for Under 18's. This is half board, so a full Breakfast and Evening Meal each day are included. There will be Trade Stands and Give-aways too, and, of course, a chance to meet up for our annual chin wag and party! You do need to book this now! It has become one of the leading UK meets of the year and you don't want to miss it!

MACNA XX, September 5 - 7

Date: Friday, September 5 through Sunday, September 7, 2008
Location: The Westin Peachtree Plaza, 210 Peachtree Street, Atlanta, Georgia 30303
Website: http://www.macnaxx.com

Presented by Atlanta Reef Club and MASNA, MACNA is the largest hobbyist marine conference in North America. New aquarium products, vendors will often wait until MACNA to release new products into the hobby. Hobby professionals, you will have a chance to meet and mingle with professionals in the hobby like Eric Borneman and Anthony Calfo. A chance to be at a conference with hundreds of other people just as obsessed with aquariums as you are.

We have selected the Westin Peachtree Plaza as the host hotel for this event. It is the tallest hotel in the western hemisphere. Our negotiated room rate is $119.00 per night with discounted parking. Everyone that stays in the hotel will be given free internet access from their rooms.

This 73-story tower, topped by the revolving Sun Dial Restaurant, Bar & View, graces the heart of Atlanta. Connected to AmericasMart, The Westin Peachtree Plaza, is steps from CNN, Georgia Aquarium, Georgia World Congress Center and the Georgia Dome.

Contact Information:

MACNA XX
1266 West Paces Ferry Rd.
Suite 194
Atlanta, GA 30327
PHONE:
FAX: 860.540.2351
E-mail: info@macnaxx.com
Contact Form

PRODUCT REVIEW

EcoTech Marine VorTech Part 1: Basic Introduction

By Adam Blundell M.S.

For a hobbyist who truly wants to create water motion, change the flow, or create a very dynamic system, then this pump is the real deal. The VorTech pump is awesome.

Published May 2008, Advanced Aquarist's Online Magazine.

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Keywords (AdvancedAquarist.com Search Enabled): Adam Blundell M.S., Flow, Product Review, Water Circulation
Link to original article: http://www.advancedaquarist.com/2008/5/review

Authors Note - Between the time of writing this article and the publication date, I discovered that a friend of mine was also working with this product. Jake Adams and I are now working together to co-author a piece showing some of advanced VorTech capabilities.

Introduction

Buy this pump! I decided to start this article off with that sentence just to make sure every reader saw it. I've tried out many products and I've seen all the developments and designs used for water motion. The capabilities of the VorTech (mostly derived from the software based computer system) are really second to none.

Background

My interest in the VorTech pump stemmed from my constant battle with finding my ideal water flow. I'll admit that I frequently change my opinion on just what is the best flow, but I've always been leery of laminar flow found in gyre systems. My take is to mix it up and keep it going. In recent months my friend and fellow author Jake Adams has produced some compelling arguments for laminar flow, and I'll address those ideas next month. However I still like some back and forth sloshing in my tank. When it comes to changing up the flow in your tank, nothing beats the VorTech.

VorTech Basics

The EcoTech Marine VorTech pump is a propeller style pump. Propeller pumps have made a huge splash in the hobby. Over the last couple years we've seen numerous modification kits and even propeller designed pumps take of the market. The VorTech, however, features a couple unique features.

Magnetic Induction - one of the highly promoted aspects of the VorTech is the induction driven pump. This means that the pump sits on the outside of the tank and magnetically drives the propeller on the inside of the tank. This helps to reduce the amount of heat entering the system as the pump is not in the water. It also removes the pump from the visible area in the tank (some people really don't like seeing large pumps and wire in their tank).

Multiple Controls - the VorTech also possesses many modes of operation. The VorTech has 4 main modes of water flow. They are:

1. Constant Speed
2. Lagoon Random (quickly changing speeds either up or down)
3. Reef Crest Random (slowly changing speeds either up or down)
4. Pulse Mode (the pump speeds up and slows down at a rate chosen by the user)

These four modes are absolutely fabulous for someone who likes to change up their water flow.

Expanding Abilities - the VorTech pump also has many change-up modes when expanded to more than one pump. Having two VorTech pumps (something highly recommended by this author) allows the user to create an enormous variation in their water flow design. Two pumps could both be set to a Lagoon Random

mode and you would have two pumps independently altering their current output. The same holds true for Reef Crest Random and two different Pulse Speed settings. But wait, there's more…

Having two VorTech pumps with wireless sync modes allows for extra variation. Two pumps can be used on a tank and the two pumps can "talk to each other." You can set one pump to a Lagoon Random mode and then "tell" the other pump to simulate what the first pump is doing (speed up when the other pump speeds up and slow down when the other pump slows down). Consequently you can also "tell" the second pump to do the opposite of the first pump (speed up when the other slows down and slow down when the other pump speeds up).

This variation is just one feature that separates the VorTech from other pumps.

VorTech Directions

I decided to list a few important items that I (and others) have found out regarding the usage of the VorTech.

1. EcoTech Marine is awesome. That pretty much sums up their company, their customer service, their care about the effectiveness of their products, and their desire to make something work well.

Shown here by using VorTech pumps the aquarist can create a wave effect. Look at the rise and drop of the water level as wave alternates.

2. Read the instructions. The VorTech pump (MP40w) includes an instruction book that is well worth reading. In addition to a thorough explanation of how the pump works, it also covers the needed maintenance and warranty information.

Rise and fall of the water level.

The VorTech propeller was specifically designed to produce a high volume low flow current.

3. Keep away from idiots. I was going to say keep away from children, but I've actually seen far more adults with the impulse to pull the pump off the tank and say "what's this?" It is wise to securely attach the pump to the outside of the tank to prevent it from falling to the floor. In fact it is such a good idea that it is described and mentioned 3 times in the instruction manual.

4. Keep your dry-side dry. Don't ever let your wet-side touch the dry-side, and more importantly don't let the dry-side get wet. It is called the dry-side for a reason; keep it out of the water stupid.

5. Keep the wet-side wet. It is explicitly stated in the instruction to not run the pump with the wet-side out of water. It is possible to heat up and melt the wet-side. I tested this by running my pump out of water for several minutes as I recorded the rpm speed of the propeller at low and high speeds (more on this next month). Yep, I can verify that you shouldn't do that.

Conclusion

I've spent a lot of time over the last few months playing with this pump. Some things scare me (like someone dropping the dry-side 6 feet to the floor, or someone getting the dry-side wet), but without a doubt this is a super product. If someone is looking to move water in a tank they should look at any one of the much cheaper pumps out there. But for a hobbyist who truly wants to create water motion, change the flow, or create a very dynamic system, then this pump is the real deal. The VorTech pump is awesome. Again that is the best way to sum this up. I'll be showing examples of the water flow produced and the differing modes in an upcoming article. Also, a write up of wave characteristics is on the way.

Author Information

Adam Blundell M.S. works in Marine Ecology, and in Pathology for the University of Utah. He is also Director of The Aquatic & Terrestrial Research Team, a group which utilizes research projects to bring together hobbyists and scientists. His vision is to see this type of collaboration lead to further advancements in aquarium husbandry. While not in the lab Adam provides services for of one of the Nation's largest hobbyist clubs, the Wasatch Marine Aquarium Society (www.utahreefs.com). Adam has earned a BS in Marine Biology and an MS in the Natural Resource and Health fields. Adam can be contacted at adamblundell@hotmail.com.

ONLINE NEWS

Reefs in the News

From Online News Sources

Media coverage of the state of our world's reefs, interesting information, and other marine-related news.

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Link to original article: http://www.advancedaquarist.com/marinenews

Saltwater fish tank harder than thought (Asbury Park Press)

Yahoo! Coral Reefs News
June 01, 2008 12:41 PM

Q: The owner of the Pet Agree store in Stafford guided me in buying a 13-gallon saltwater reef tank and equipment on March 28, 2007. I've returned to the store numerous times for help and each time was sold something else to "fix the problem."

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=12j7plalc/*http%3A//www.app.com/apps/pbcs.dll/article?AID=/20080601/TROUBLESHOOTER/806010350

Bush asked to protect deep sea reef off SC coast (The Beaufort Gazette)

Yahoo! Coral Reefs News
June 01, 2008 04:14 AM

BLUFFTON -- A quarter of a mile under the sea, rows of 500-foot tall coral reef pinnacles form a forest for deep water fish, shrimp, crabs and other marine species many scientists didn't know existed until a decade ago.

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=11qa4f71q/*http%3A//www.beaufort-gazette.com/local/story/453413.html

Our Ocean Backyard, Dan Haifley: Spineless sea creatures saved our shores (Santa Cruz Sentinel)

National Marine Sanctuary in the News
June 01, 2008 08:58 AM

The true heroes in the recent, successful effort to protect our coastline are spineless, wet and slimy.

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Southeast teacher sets sail for research (The Dalton Daily Citizen)

Yahoo! Coral Reefs News
June 01, 2008 01:31 AM

This time, Kathryn Kornberg was the student. Kornberg, an earth systems science teacher at Southeast High School, spent a week aboard the ship Nancy Foster as part of a National Oceanic and Atmospheric Administration (NOAA) research cruise last month.

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All alone in the South China Sea (The New Zealand Herald)

Yahoo! Coral Reefs News
May 31, 2008 11:25 PM

There are lots of people who like to think that they've "discovered" the next secret destination. And that's what lots of people do when they smugly arrive on Pulau Tioman, an island positioned like a full stop off the south east coast of Malaysia.

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Word to the wise: Hungry sharks are expanding their range (San Francisco Chronicle)

National Marine Sanctuary in the News
May 31, 2008 10:17 PM

The Big Dude in the Gray Suit has been hungry this spring. He's also known as "The S Word" among surfers and divers, and some call him "Big Whitey." You may recognize him as the great white shark, but by any name, he's been creating havoc in Mexico in the...

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http://us.rd.yahoo.com/dailynews/rss/search/%22National+Marine+Sanctuary%22/SIG=12u815q8q/*http%3A//www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/05/31/SP231107UP.DTL&feed=rss.sports

Travel story: On the reef in Belize (Vail Daily)

Yahoo! Coral Reefs News
May 31, 2008 05:26 PM

TURNEFFE ATOLL, Belize - Rarely do tropical island-dwellers praise hurricanes, so Leigh and I listen up when Carlos Miller starts to explain how the periodic storms help sustain the mangrove-coral ecosystem of Cockroach Caye.

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Efforts to remove artificial tire reef ends for season (7 News Miami)

Yahoo! Coral Reefs News
May 31, 2008 11:18 AM

WEST PALM BEACH, Fla. -- An effort to remove some 700,000 old tires from the ocean floor about a mile offshore of Fort Lauderdale has ended for the season.

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=11tcbfejg/*http%3A//www.wsvn.com/rss/read/news/articles/local/MI87272/

Family prefers Great Lakes beaches to the ocean (AP via Yahoo! News)

National Marine Sanctuary in the News
May 30, 2008 08:12 PM

Every summer, when I tell friends that my family is bailing out of steamy Washington D.C. to head for the beach, they assume we're off to Rehoboth or Dewey in Delaware, or another one of the usual suspects on the Atlantic Ocean.

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Source:
http://us.rd.yahoo.com/dailynews/rss/search/%22National+Marine+Sanctuary%22/SIG=12mnm9i8n/*http%3A//news.yahoo.com/s/ap_travel/20080530/ap_tr_ge/travel_trip_michigan_beaches_1

Draft Revised Recovery Plan for the Northwest Atlantic Loggerhead Sea Turtle Available for Review

NOAA News Releases
May 30, 2008 04:29 PM

NOAA's Fisheries Service and the U.S. Fish and Wildlife Service (USFWS) are seeking public input on the draft revised recovery plan for the northwest Atlantic population of the Loggerhead Sea Turtle (Caretta caretta). The species is listed globally as threatened under the Endangered Species Act.

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Source:
http://www.noaanews.noaa.gov/stories2008/20080530_loggerhead.html

Aquarium offers glimpse of life on a coral reef (Deseret Morning News)

Yahoo! Coral Reefs News
May 30, 2008 06:09 AM

Excitement radiated from Garrett Platt's 2-year-old eyes as he ran between jellyfish, shark and coral reef exhibits.

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Source:
http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=11r8dmfue/*http%3A//deseretnews.com/dn/view/0,5143,700230234,00.html

Enjoying over and under sea experiences (Shelbyville Daily Union)

Yahoo! Coral Reefs News
May 29, 2008 09:20 PM

By Dave Zuchowski NEW CASTLE NEWS (NEW CASTLE, Pa.) NEW CASTLE, Pa. - Every morning MS Veendam passengers open their doors to a world of possibilities.

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=13aml05me/*http%3A//www.shelbyvilledailyunion.com/features/cnhinstravel_story_150081255.html?keyword=secondarystory

Japan finding itself in hot water (The Japan Times)

Yahoo! Coral Reefs News
May 29, 2008 09:12 PM

SADO, Niigata Pref. - " Kyuichi Sakano, head of Niigata's fixed shore net fishing association, sighed in dismay one day last December as his fishing boats came back yet again without any yellowtail. "The business is very severe," said Sakano, who owns two stationary fishing nets off Sado Island. Read the full story

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=110qdce6g/*http%3A//search.japantimes.co.jp/rss/nn20080530f1.html

Mack H. Barnes (Coral Gables Gazette)

Yahoo! Coral Reefs News
May 29, 2008 05:32 PM

Mack H. Barnes, Jr., 89. This great man died of congestive heart failure at his home in Coral Gables , May 23, his wife Virginia by his side. His nickname was "Red" but he was called by many "the last of the great Southern Gentlemen."

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http://us.rd.yahoo.com/dailynews/rss/search/coral+reef/SIG=11ppruqq0/*http%3A//cggazette.com/absolutenm/templates/?a=3810&z=1

NOAA Scientist Elected to The Royal Society

NOAA News Releases
May 29, 2008 05:12 PM

NOAA Senior Scientist Susan Solomon, whose pioneering research has helped explain the cause of the ozone hole and for her leadership as co-chair of Working Group 1 for the recent Intergovernmental Panel on Climate Change assessment report, has been elected as a Foreign Member of The Royal Society of the United Kingdom.

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Source:
http://www.noaanews.noaa.gov/stories2008/20080529_solomon.html

Fossil captures 380-million-year-old live birth (AFP via Yahoo! News)

Yahoo! Coral Reefs News
May 28, 2008 05:51 PM

She is the oldest mother of any species ever found, a 380-million-year-old fish immortalised in a fossil while still attached to her offspring by an umbilical cord.

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At AquaCave, we offer a large selection of aquarium supplies for both, freshwater and saltwater enthusiasts. The prices and quality of our aquarium equipment keep our customers coming back. We stock thousands of aquarium supplies such as protein skimmers, air pumps, water pumps and power heads, full line of CO_2 equipment, calcium reactors, aquarium lighting, fish food, refugiums, aquarium filters, heaters, and much more. New items are added daily so please visit us often to get the latest high quality products at great prices.

HelloLights

HelloLights has been in business since 1997 providing the aquarium industry with high quality lighting products and accessories. Throughout the years, our mission has been to be the aquarium hobbyist? one stop source for all of their lighting needs. With unsurpassed customer service and high quality products, we truly believe we are the clear choice for aquarium lighting. We realize that lighting is one of the major purchases that the hobbyist will make when setting up an aquarium, and we take great pride in our role in this process.

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MarineDepot.com is the current leader in supplying marine and reef aquarium supplies. We simply try to make as many people (including both our staff and our customers) as happy as possible. We found that we have been able to accomplish this by maintaining extremely low prices, providing friendly customer service, and simply liking what we do.

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Premium Aquatics is a family owned and operated aquarium business. We have been in business since April 1996 and we are dedicated to serving the aquarium hobbyist. Our mission is to bring you the highest quality aquarium products and livestock available and at a reasonable price and to provide honest non-bias information on all of our products and our competitors. Our goal is customer satisfaction, we want your return business.

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The Two Part Solution is a method of adding calcium, alkalinity and magnesium to your reef aquarium. What's unique about this solution is many of the items used are household items or just bulk supplies of the very same products you are buying two cups of for $20 just because it has a fancy package. It has been time tested by thousands of aquarists and proven to not only be incredibly effective and easy to use but also extremely affordable. There is simply no other balanced calcium, alkalinity and magnesium solution out there that is so ridiculously cheap and has no expensive and intimidating equipment to buy.

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AquaC, Inc. was founded in 1998 as a small one-man operation that focused on providing exceptional products and stellar customer service. Since that time, the company has rapidly developed into one of the fastest growing marine filtration manufacturer's in the industry. Although we now offer a variety of product lines and manufacture thousands of units each year, our focus remains the same - quality products and top-notch customer service.

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Deltec aquarium equipment is renowned throughout the world for its high performance and superior quality. Deltec has been in the marine aquarium business for more than 20 years in Europe, and developed the pinwheel more than 19 years ago.

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Quality Aquarium supplies, equipment, and livestock at reasonable prices. J&L Aquatics was formed in December 1997. Our business was started from our love of the aquarium hobby. We at J&L Aquatics felt that the Canadian aquarist should have the option to purchase top quality supplies, equipment and livestock other than the generally over priced local retail stores. With this philosophy in mind we have successfully operated and grown our business for the past five years.

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Reef Nutrition Marine Live Feeds are produced by Reed Mariculture, the world's largest producer of marine microalgae concentrates. We supply algal feeds and zooplankton to universities, marine ornamental growers, and over 500 fish, shrimp, and shellfish hatcheries in 70+ countries around the world.

Southern California Caulerpa Action Team

An important goal of the Southern California Caulerpa Action Team is the detection of undiscovered infestations of C. taxifolia or other invasive species of Caulerpa, and the prevention of their spread.

Sunlight Supply, Inc.

Sunlight Supply Inc. is a manufacturer and importer of High Intensity Discharge (H.I.D.) and fluorescent lighting fixtures. We specialize in fixtures with applications in the hobby & commercial horticulture and reef tank aquarium industries. Sunlight Supply Inc. is a recognized and respected leading brand in the marketplace.

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We are the original Aquatic and Pet Supply Superstore! Every year, tens of thousands of visitors come from all over the US and Canada to explore our 110,000 square foot retail store. Bring your pet along and check out our incomparable fish room with over 800 aquariums!

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AquariumPart.com is an online retailer of many hard to find parts for various aquarium lights, pumps, protein skimmers, meters, UV sterilizers and filters.

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Quality Reef Aquarium Lighting and Supplies Quality Reef Aquarium Lighting and Supplies.

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saltwaterfish.com

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Your source for saltwater and reef aquarium supplies and equipment here online, or come visit us at our full service walk-in retail location.

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reefs.org
WHERE REEFKEEPING BEGINS ON THE INTERNET

"www.reefs.org - If you had to pick a "one-stop shop" for everything online for reefs, this would be it. If you can't find it here, you can't find it." – Richard Sexton, Tropical Fish Hobbyist, November, 2002

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